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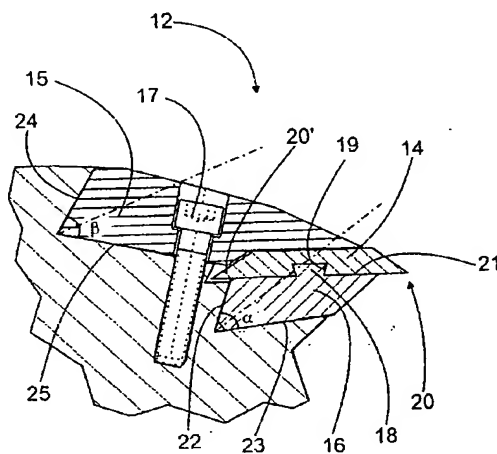
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[Continued on next page]

(54) Title: KNIFE ASSEMBLY FOR A CHIPPER



(57) Abstract: The invention relates to a knife assembly for a chipper, which is intended to be installed in the knife frame (11). The knife assembly (12) includes a counter knife (16), a reversible knife (14) including two cutting bevel edges (20, 20'), and a clamp (15). In addition, the knife assembly (12) includes securing means (17) for securing the clamp (15) and at least one locking piece (18) running parallel to the longitudinal axis of the reversible knife (14) to prevent lateral movement of the reversible knife (14) relative to the counter knife (16). The reversible knife (14), the counter knife (16), and the locking piece (18) are arranged in such a way that the position of the reversible knife (14) relative to the knife frame (11) can be set as desired. The locking piece (18) is also arranged to form a fixed part of the reversible knife (14) or the counter knife (16), and the counter knife (16) is fitted to the knife frame (11) using shape-locking.

WO 03/068467 A1

WO 03/068467 A1



*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

## CLAIMS

1. A knife assembly for a chipper, which is intended to be installed in the knife frame (11) forming part of the chipper, and which knife assembly (12) includes
- a counter knife (16) fitted to the knife frame (11),
  - an essentially symmetrical reversible knife (14) set against the counter knife (16), at the opposite sides of which there are two cutting bevel edges (20, 20'), one of which cutting bevel edges (20) extends further than the counter knife (16) from the knife frame (11),
  - a clamp (15), which is arranged to press on the reversible knife (14) from the opposite side than the counter knife (16),
  - securing means (17) for securing the clamp (15) and tightening it onto the knife frame (11) and thus for pressing the reversible knife (14) between the clamp (15) and the counter knife (16), and
  - at least one locking piece (18), which runs parallel to the longitudinal axis of the reversible knife (14) and which extends on both sides of the boundary surface (21) between the reversible knife (14) and the counter knife (16), in order to prevent lateral movement of the reversible knife (14) relative to the counter knife (16),
- in which knife assembly (12) the reversible knife (14), the counter knife (16), and the locking piece (18) are arranged in such a way that the position of the reversible knife (14) relative to the knife frame (11) can be set as desired in the lateral direction of the reversible knife (14), characterized in that the locking piece (18) is arranged to form a fixed part of the reversible knife (14) or the counter knife (16), and the counter knife (16) is fitted to the knife frame (11) using shape-locking.
2. A knife assembly according to Claim 1, characterized in that the locking piece (18) is arranged in the counter knife

REPLACED BY  
ART 34 AMDT

WO 03/068467

PCT/FI03/00111

12

(16), a groove (19) corresponding to it being arranged in the reversible knife (14) while the width of the locking piece (18) is the lateral direction of the reversible knife (14) is greater than the height of the locking piece (18).

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3. A knife assembly according to Claim 1 or 2, characterized in that the counter knife (16) and the clamp (15) are arranged to be supported directly on the knife frame (11).

10 4. A knife assembly according to any of Claims 1 - 3, characterized in that the counter knife (16) has two counter-surfaces (22, 23) arranged to rest on the knife frame (11), which are arranged to form an acute angle  $\alpha$ , the size of which is 25 - 75°, preferably 35 - 70°.

15

5. A knife assembly according to any of Claims 1 - 3, characterized in that the clamp (15) has two counter-surfaces (24, 25) arranged to rest on the knife frame (11), which are arranged to form an acute angle  $\beta$ , the size of which is 40 -  
20 85°, preferably 45 - 75°.

6. A knife assembly according to Claim 4 or 5, characterized in that the angle between the bisectors of angles  $\alpha$  and  $\beta$  is maximum 20°.

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7. A counter-knife series for a knife assembly according to any of Claims 1 - 6, in which knife assembly both cutting bevel edges (20, 20') of the reversible knife (14) are arranged so that they can be sharpened, characterized in that for each  
30 sharpened reversible knife (14) the counter-knife series includes a corresponding counter knife (16), in order to adapt the position of the sharpened cutting bevel edge (20, 20'), relative to the knife frame (11), to be the same as it was prior to sharpening.

35

REPLACED BY  
ART 34 AMDT

WO 03/068467

PCT/FI03/00111

13

8. A counter-knife series according to Claim 7, characterized in that the counter-knife series includes 1 - 6, preferably 2 - 5 different counter knives (16) for changing the position of the reversible knife (14) by 0,5 - 1,5 mm, 5 preferably 0,8 - 1,2 mm in the lateral direction of the reversible knife (14), after sharpening.

9. A counter-knife series according to Claim 7 or 8, characterized in that the counter-knife series includes at 10 least one second counter-knife series including a corresponding number of counter knives (16), in which the angle  $\gamma$  of the counter bevel edge (26) of the counter knives (16) and/or the distance of the cutting bevel edge (20) from the counter bevel edge (26) are different to those in the first counter-knife 15 series.

10. A counter-knife series according to any of Claims 7 - 9, characterized in that the counter knives (16) are precipitation-hardened cast pieces or rolled pieces.

20

REPLACED BY  
ART 34 AMDT

## INTERNATIONAL SEARCH REPORT

International application No.

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## A. CLASSIFICATION OF SUBJECT MATTER

IPC7: B27L 11/00, B27G 13/10

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC7: B27L, B27G

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

WPI, EPODOC

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5996655 A (PATRICK J. CRAMOND ET AL), 7 December 1999 (07.12.99), column 4, line 17 - line 26, figure 3	1,2
A	--	3-10
A	US 4771718 A (CHARLES T. CARPENTER ET AL), 20 Sept 1988 (20.09.88)	1-10
A	DE 10000330 A1 (HAPRO HOLZBEARBEITUNGS-WERKZEUGE GMBH), 19 July 2001 (19.07.01)	1-10
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☐ Further documents are listed in the continuation of Box C.☒ See patent family annex.

\* Special categories of cited documents:

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"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

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"Y" document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&amp;" document member of the same patent family

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**INTERNATIONAL SEARCH REPORT**  
Information on patent family members

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Patent document cited in search report			Publication date	Patent family member(s)	Publication date
US	5996655	A	07/12/99	CA 2255427 C	01/05/01
US	4771718	A	20/09/88	US 4850408 A	25/07/89
DE	10000330	A1	19/07/01	NONE	

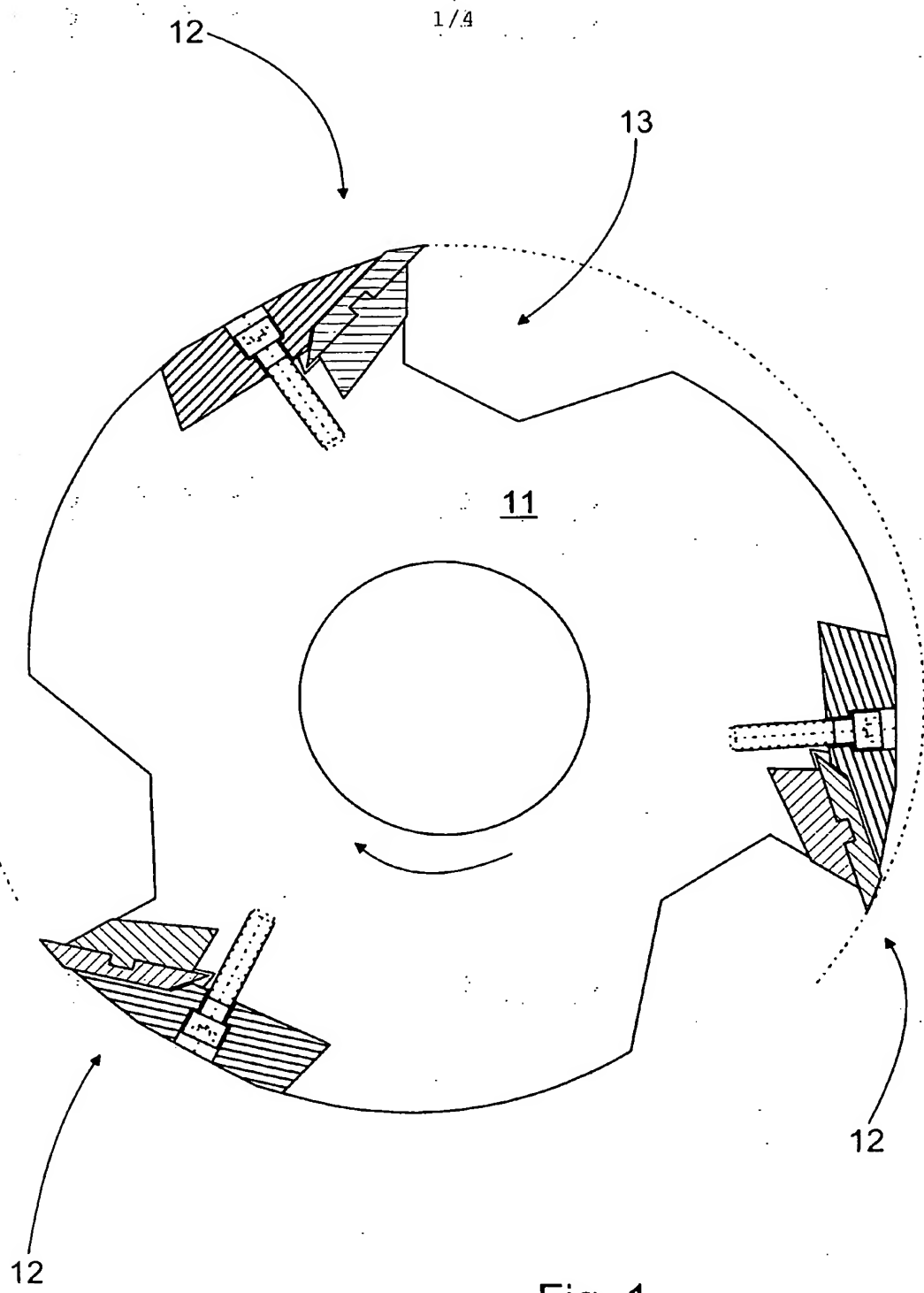
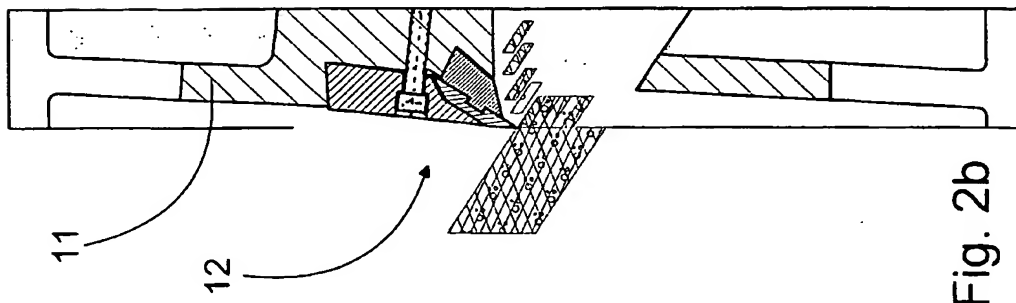
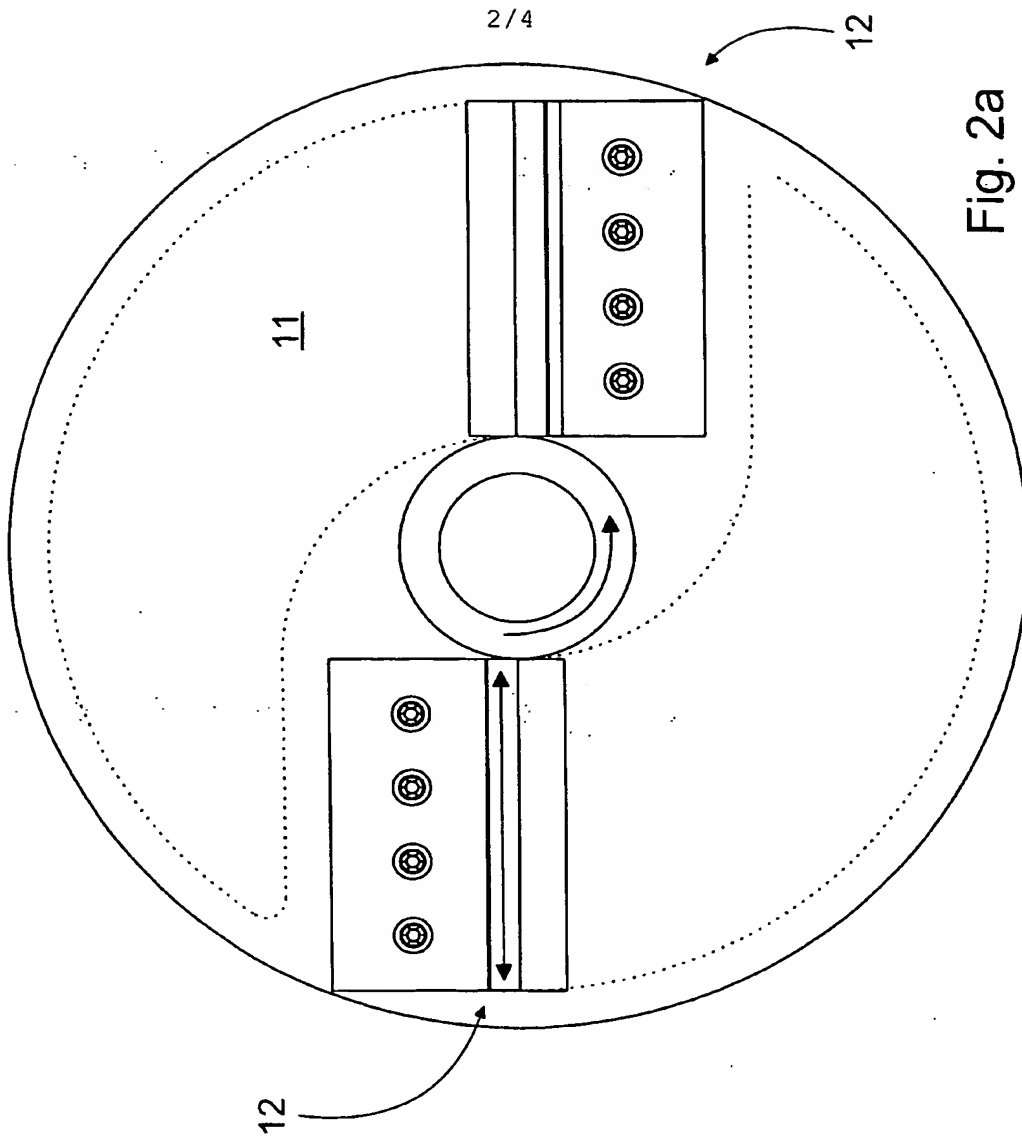


Fig. 1





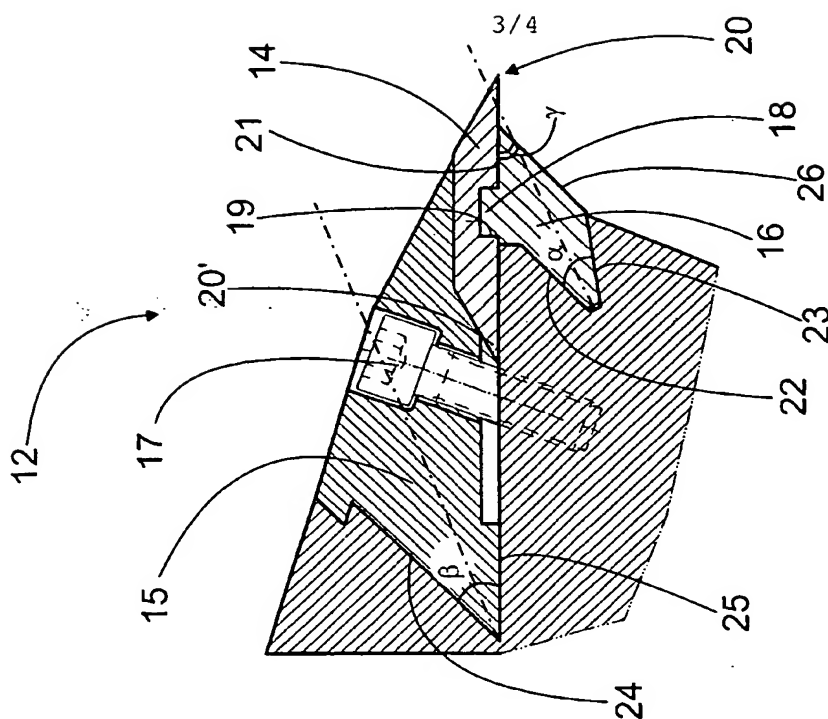


Fig. 3b

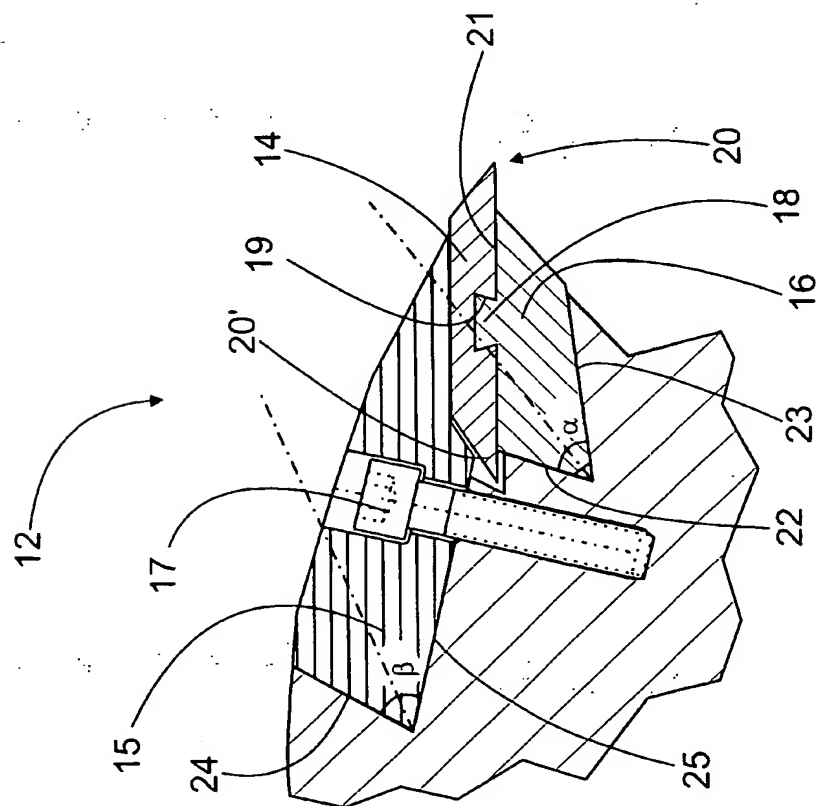


Fig. 3a

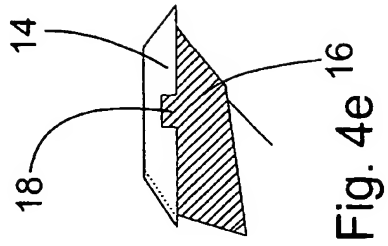


Fig. 4a

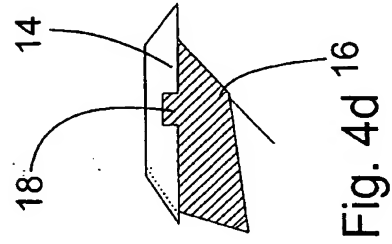


Fig. 4b

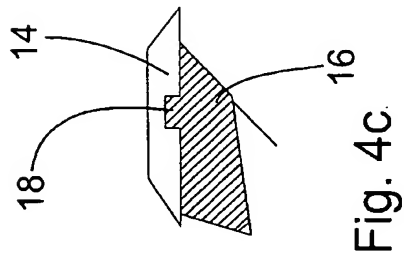


Fig. 4c

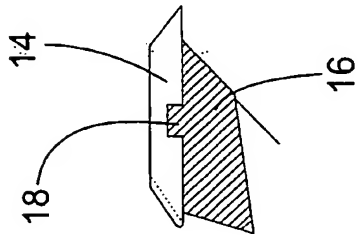


Fig. 4d

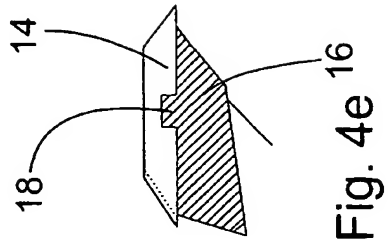


Fig. 4e

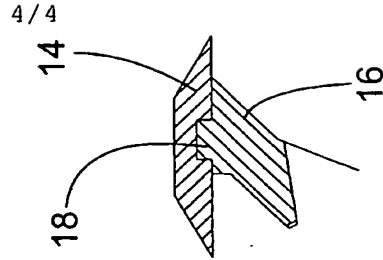


Fig. 4f

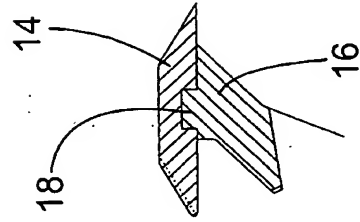


Fig. 4g

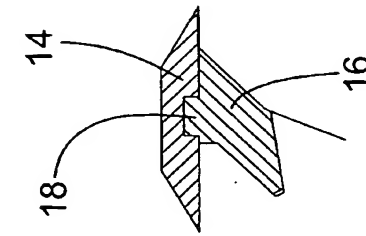


Fig. 4h

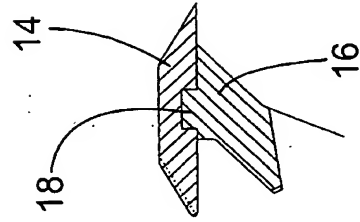


Fig. 4i

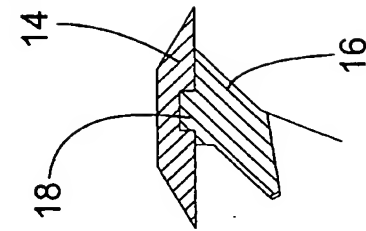


Fig. 4j